

## Diet of courtship feeding Herring Gulls in the Gulf of Finland

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Courtship feeding is common in many species of gulls (Niehbur 1981, Salzer & Larkin 1990, Tasker & Mills 1981). In the Herring Gull *Larus argentatus* Hario et al. (1991) found that males lost weight and depleted endogenous lipid reserves before the onset of laying, while females gained both weight and stored lipids. This suggested that courtship feeding may be important as a source of nutrition for a laying female (see also Tasker & Mills 1981). The stomach contents of Herring Gulls in the study of Hario et al. (1991) suggested that Baltic Herring *Clupea harengus* may have been an important source of food for pre-breeding Herring Gulls in the Gulf of Finland, but little is known about diet preferences during this early phase of breeding in any population of Herring Gulls.

Bolton et al. (1992, 1993) recently suggested that variation in the intake of especially protein and other nutrients may influence egg quality in Lesser Black-backed Gulls *L. fuscus*. Females fed extra fish (protein rich food) laid last eggs with larger yolks, and females fed gull eggs laid larger eggs than controls. This suggests that fish and eggs are beneficial food for laying gulls.

We identified items brought to pre-laying female Herring Gulls by their mates in a colony in the western part of the Gulf of Finland (Storsundsharun, Tvärminne, 60°N 23°E) as a first step to clarify diet choice during courtship feeding. We observed Herring Gull pairs during the pre-laying period from 13 April to 5 May, from hides with binoculars and telescopes. We were able to identify 60 items offered to females.

The pairs had started to arrive at the colony in March, and in the first week of April courtship displays in the air began. The snow had melted by the time the pairs began displaying and making nest scrapes. The sea was largely free of ice by April 10. The first clutch in the colony was initiated on April 16.

We identified courtship feeding items from 42 territories (Table 1). Clupeoid fish (Herring or Sprat *C. sprattus*) was fed most commonly, and fish was the most frequent item seen during the feedings. Eggs were offered to females on at least 13 territories. Most eggs fed were probably Eider *Somateria mollissima* eggs (several identified by remains of eggshells) but at least a few Herring Gull eggs were also fed. Male Herring Gulls were capable of swallowing Eider eggs intact, and could even regurgitate them unbroken.

Garbage was not common among the items. Garbage was fed at about the same frequency as during chick rearing (Hillström et al. 1994). The two identified birds, which had been preyed upon were taken by a male which previously (Hillström et al. 1994) had been identified as an Eider chick specialist during brood rearing.

The Herring Gulls on Storsundsharun were previously been studied by Hillström et al. (1994) and found to be largely preying on fish during brood rearing. They seem to rely on fish also during courtship feeding. Fish, such as Herring and Sprat, are good protein sources (Hillström et al. 1994). This further underlines that Herring Gulls in the northern Baltic may not be as dependent on refuse and

antropogenic waste as often implied (see Hillström et al. 1994).

The utilization of eggs is interesting. Eggs were most often presented to females by regurgitating the contents of broken eggs directly onto the ground. The females would painstakingly feed on the egg by scraping the contents off the ground with the side of the bill-tip, with tilted heads. This way of feeding was very time consuming, and it is hard to imagine that feeding on eggs in such a way would have very much value in terms of energy intake. However, eggs may contain some other nutrients, not present in fish, as suggested by Bolton et al. (1992) which would make it profitable for the female to feed on them. Bolton et al. (1992) suggested that egg formation could be limited by the lack of supply of specific nutrients, possibly certain amino acids, which would be present in an egg supplement. They suggested that the frequent egg robbing of gulls may serve to increase the supply of these specific nutrients. We do not know whether the females we studied themselves preyed on eggs, or if they relied only on eggs brought by the males. The very limited time spent foraging by the females we studied, during the last 2 weeks before laying (when Eider eggs also became available), suggests to us that females had limited access to

eggs, and were indeed relying on males. The pairs on Storsundsharun lay large last-laid eggs, which is indicative of a good feeding situation (Kilpi et al. 1995), and it may be that whatever nutrients they get from eating eggs would have to suffice in small quantities.

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### Sammandrag: **Diet hos frierimatande gråtrutar i Finska Viken.**

Hos gråtruten matas honan av hanen en tid innan äggläggningen (frierimatning). Vi kunde identifiera 60 måltider på 42 territorier utanför Tvärminne 1994. Fisk var det mest frekventa bytet hanar hade med sig (Tabell 1). Trutarna åt också fågelägg (mest ejder). Det är besvärligt för en truthona att äta innehållet på ett ägg som spys upp på marken. Det har föreslagits att trutarna ur ägg söker specifika aminosyror, som kanske saknas i en fiskdiet, men som är viktiga vid äggläggningen. Vi tror att i så fall måste honorna klara sig med mycket små tillskott av ägg.

Table 1. Identified items fed by Herring Gull males on 42 territories at the Storsundsharun colony in 1994.

Item	Number of items (%, n = 60)	No. of, and % of territories item fed on (n = 42)
Clupeoid fish	15 (25.0)	13 (30.9)
Perch <i>Perca fluviatilis</i>	10 (16.7)	10 (23.8)
Eelpout <i>Zoarces viviparus</i>	5 (6.7)	5 (11.9)
Cyprinid fish	1 (1.7)	1 (2.4)
Unidentified fish	2 (3.4)	2 (4.8)
<b>Total fish</b>	<b>33 (55.0)</b>	<b>30 (71.4)</b>
Bird eggs	16 (26.7)	13 (30.9)
Garbage	7 (11.7)	7 (16.7)
Offal	1 (1.7)	1 (2.4)
Frog <i>Rana</i> sp.	1 (1.7)	1 (2.4)
Redwinged Trush <i>Turdus iliacus</i>	1 (1.7)	1 (2.4)
Robin <i>Erithacus rubecula</i>	1 (1.7)	1 (2.4)

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